

## Dr. Franklin Chang Diaz



Dr. Chang Diaz, inventor of the Variable Specific Impulse Magnetoplasma Rocket ([VASIMR](#), U.S. patent 2002) and other advanced propulsion technologies (U.S. patents 1989, 1990), founded the Ad Astra Rocket Company (AARC) in 2005, after 25 years of service as a NASA astronaut. AARC is dedicated to the development and commercialization of the VASIMR and related technologies.

**PERSONAL DATA:** Born April 5, 1950, in San Jose, Costa Rica, to the late Mr. Ramón A. Chang-Morales and Mrs. Maria Eugenia Diaz De Chang. Married to the former Peggy Marguerite Doncaster of Alexandria, Louisiana. Four children. He enjoys music, glider planes, soccer, scuba-diving, and hiking. His mother, brothers and sisters still reside in Costa Rica.

**EDUCATION:** Graduated from Colegio De La Salle in San Jose, Costa Rica, in November 1967, and from Hartford High School in Hartford, Connecticut, in 1969;

received a bachelor of science degree in mechanical engineering from the University of Connecticut in 1973 and a doctorate in applied plasma physics from the Massachusetts Institute of Technology (MIT) in 1977.

**EXPERIENCE:** While attending the University of Connecticut, he also worked as a research assistant in the Physics Department and participated in the design and construction of high energy atomic collision experiments. Following graduation in 1973, he entered graduate school at MIT, becoming heavily involved in the United States' controlled fusion program and doing intensive research in the design and operation of fusion reactors. He obtained his doctorate in the field of applied plasma physics and fusion technology and, in that same year, joined the technical staff of the Charles Stark Draper Laboratory. His work at Draper was geared strongly toward the design and integration of control systems for fusion reactor concepts and experimental devices, in both inertial and magnetic confinement fusion. In 1979, he developed a novel concept to guide and target fuel pellets in an inertial fusion reactor chamber. Later on he was engaged in the design of a new concept in rocket propulsion based on magnetically confined high temperature plasmas. As a visiting scientist with the M.I.T. Plasma Fusion Center from October 1983 to December 1993, he led the plasma propulsion program there to develop this technology for future human missions to Mars. From December 1993 to July 2005 Dr. Chang Diaz served as Director of the Advanced Space Propulsion Laboratory at the Johnson Space Center where he continued his research on plasma rockets. He is an Adjunct Professor of Physics at Rice University and the University of Houston and has presented numerous papers at technical conferences and in scientific journals. In addition to his main fields of science and engineering, he worked for 2-1/2 years as a house manager in an experimental community residence for de-institutionalizing chronic mental patients, and was heavily involved as an instructor/advisor with a rehabilitation program for hispanic drug abusers in Massachusetts. Selected by NASA in May 1980, Dr. Chang Diaz became an astronaut in August 1981. A veteran of seven space flights, STS 61-C (1986), STS-34 (1989), STS-46 (1992), STS-60 (1994), STS-75 (1996), STS-91 (1998) and STS-111 (2002), he has logged over 1,601 hours in space, including 19 hours and 31 minutes in three spacewalks. For more information on space flight experience, see [NASA biographical data](#). Dr. Chang Diaz retired from NASA in July 2005.

**SPECIAL HONORS:** Recipient of the University of Connecticut's Outstanding Alumni Award (1980); 7 NASA Space Flight Medals (1986, 1989, 1992, 1994, 1996, 1998); 2 NASA Distinguished Service Medals (1995, 1997), and 3 NASA Exceptional Service Medals (1988, 1990, 1993). In 1986, he received the Liberty Medal from President Ronald Reagan at the Statue of Liberty Centennial Celebration in New York City, and in 1987 the Medal of Excellence from the Congressional Hispanic Caucus. He received the Cross of the Venezuelan Air Force from President Jaime Lusinchi during the 68th Anniversary of the Venezuelan Air Force in Caracas, Venezuela (1988), and the Flight Achievement Award from the American Astronautical Society (1989). Recipient of four Doctorates "Honoris Causa" (Doctor of Science from the Universidad Nacional de Costa Rica; Doctor of Science from the University of Connecticut, Doctor of Law from Babson College, and Doctor of Science from the Universidade de Santiago de Chile. He is Honorary faculty at the College of Engineering, University of Costa Rica. In April 1995, the government of Costa Rica conferred on him the title of "Honorary Citizen." This is the highest honor Costa Rica confers to a foreign citizen, making him the first such honoree who was actually born there. Recipient of the American Institute of Aeronautics and Astronautics 2001 Wyld Propulsion Award for his 21 years of research on the VASIMR engine.